Aqua pools & Spa Co.

Presentation

Website : www.aquapools-spa.com

Company Profile

- **Only Public Limited Swimming Pool Company.**
- **Part of Asia's largest Water Treatment Company.**
- **Exclusive Strategic Alliance with Top International and Indian Manufacturing Companies.**
- **The First Indian Swimming Pool Company.**
- **Aspiring to be Global Company, established SE Asia office on 1st April 2008, ME and European operations to be established soon.**
- **Products designed as per Indian Operating Conditions, FINA conforming and Aquanomics Quality Norms.**

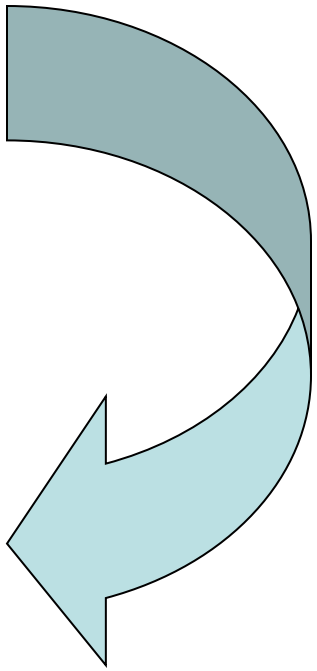
Company Profile

- **Aquanomics provides Design and Engineering Services, Pool Analysis and Project Management right from Concept to completion.**
- **Recipient of International Award by UNESCO and Water digest for 2 successive years as “Best Distribution Company”.**
- **The only pool equipment manufacturing company to offer complete solution including installation and commissioning.**
- **Largest Warehousing facility with 3 logistic centres in the country and OTIF Commitments.**

Types of Pool

- In ground Pool / Water Body.
- Above ground Pool / Water Body.

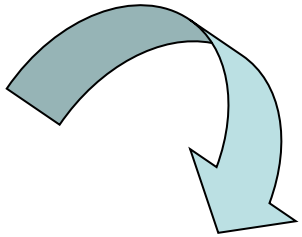
- Civil Pool
- Pre- Fab Pool
- Liner Pool
- Fiberglass pool
- Inflatable pool
- Floating Pool



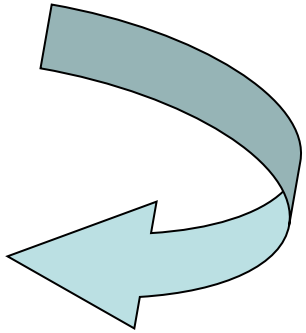
Bubbler Pools
Wave Pools
Counter current Pools
Splash Pools
Wading pools
Infinity Edge Pools
Cantilever pools …….etc

Conception to Finalization Stage

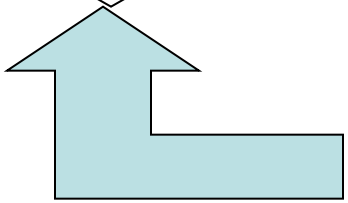
- Need of the Pool / Water Body
- Bather Load
- Type of pool
- Space constraints



- Design Backup.
- Equipment selection.
- Layout Drawing
- Site Visit & Approvals



- Execution Plan
- Supply of Equipments
- Installation and Commissioning



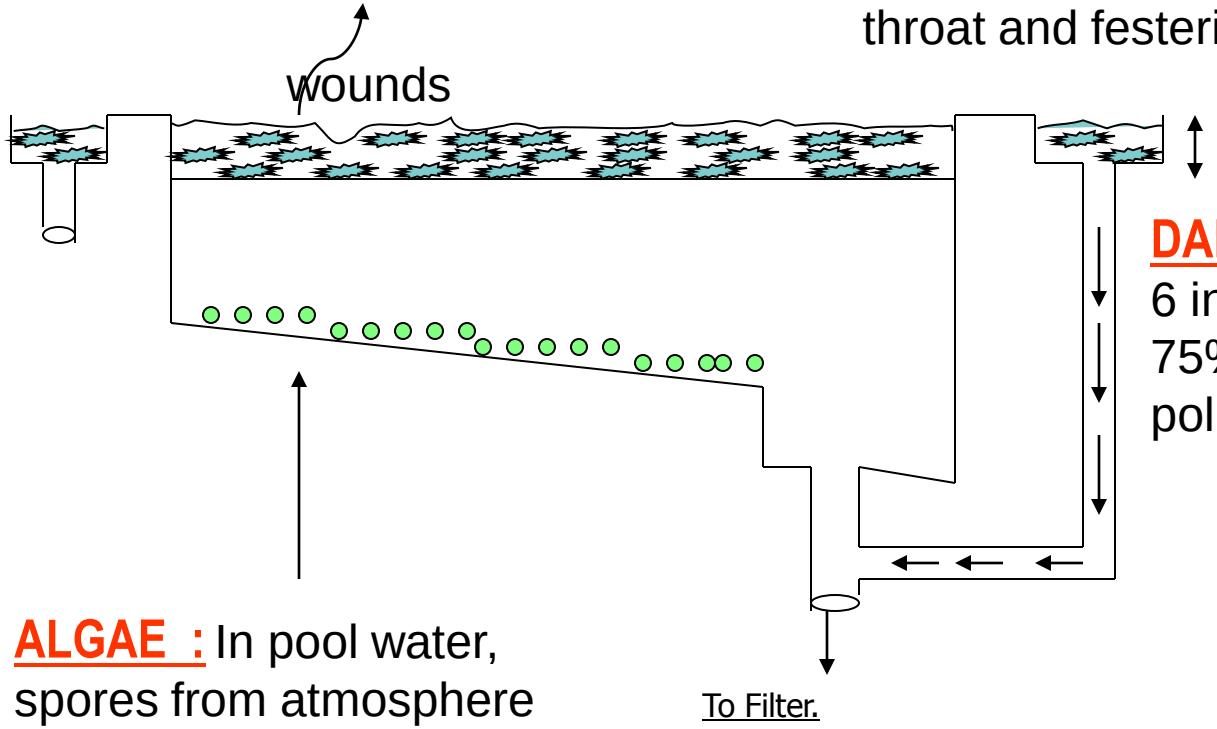
Service Manual
O & M backup
After Sale Service

Technical Insights

- All swimming pools require a purification system to ensure hygienic conditions and to remove pollutants from water at the time of usage.
- Its not limited to the purification alone, it also requires uniform distribution of purified water.
- Chemical balance utmost important to ensure good disinfection. This avoids typical problems associated with pools like skin & eye irritation, greying of hairs, loss of hairs etc.
- Two Major types of pollutants : Biological and Physical

Biological Pollutants

BACTERIA : Added by bathers most dangerous from nose, throat and festering sores & wounds

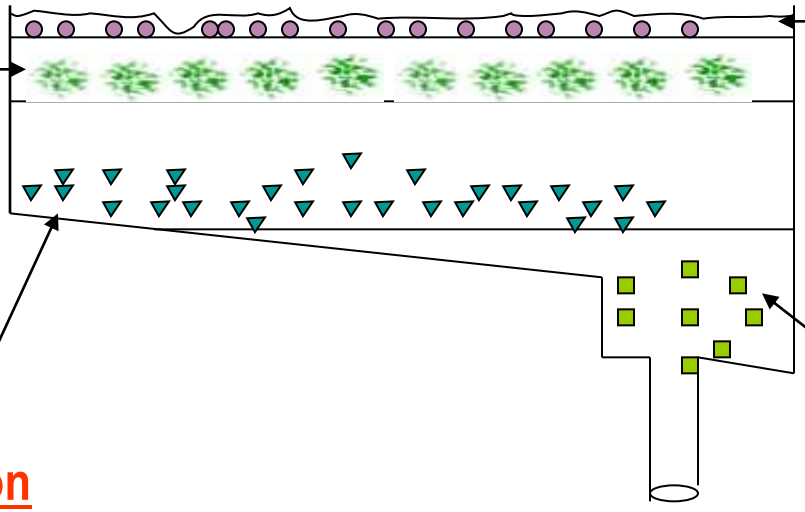


DANGER AREA : Top 6 inches contains 75% of bacterial pollution.

ALGAE : In pool water, spores from atmosphere and in main water supply.

To Filter.

Physical & Chemical Pollutants



Dissolved Pollution

Urine, Perspiration, Body Cosmetics, Sun Tan Lotions

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Surface Pollution

Hair, Dust, Body Grease,
Excreta from Nose & Throat
Floating Debris, Grass.

Suspended Pollution

Minute Chemical particles produced by chemical reactions in water treatment.

Insolubles

Fluff, Dirt (Soil, Stones)
Precipitated Chemicals.

Typical Layout - I

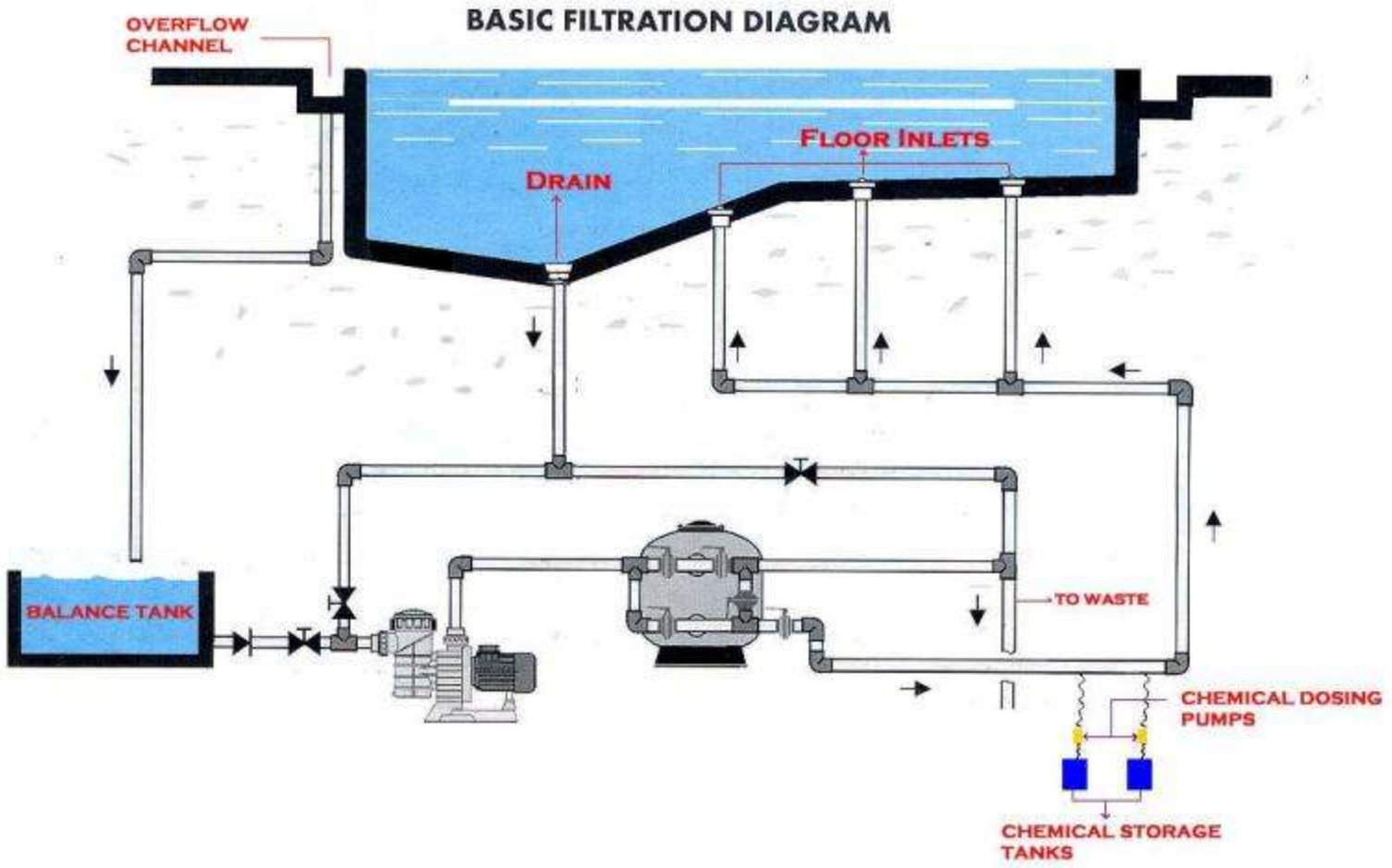


Fig : Overflow type : Recommended for pools having surface area in excess of 250 - 300 m2. Requires balance tank to take care of surge and make-up water

Typical Layout - II

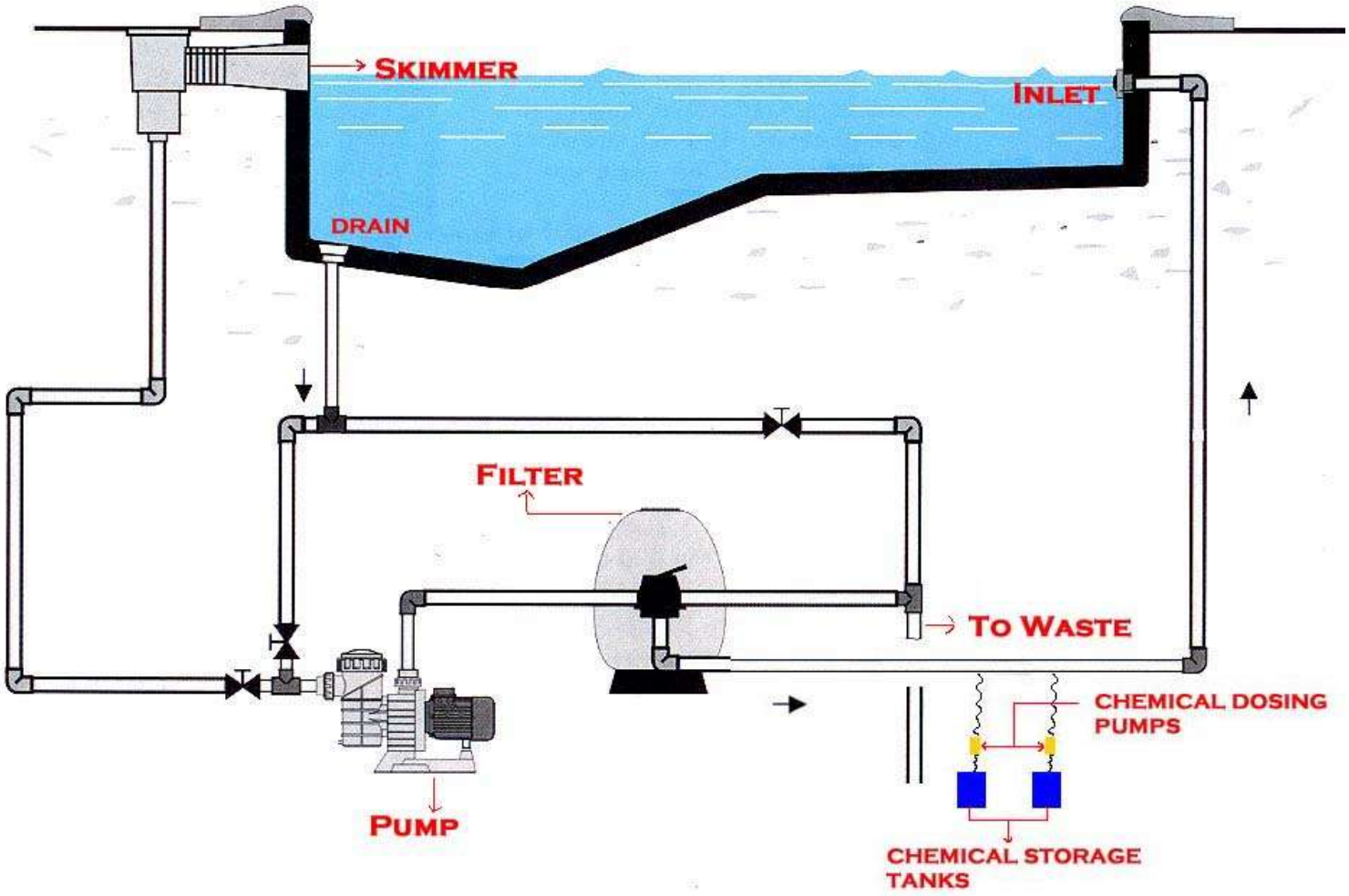
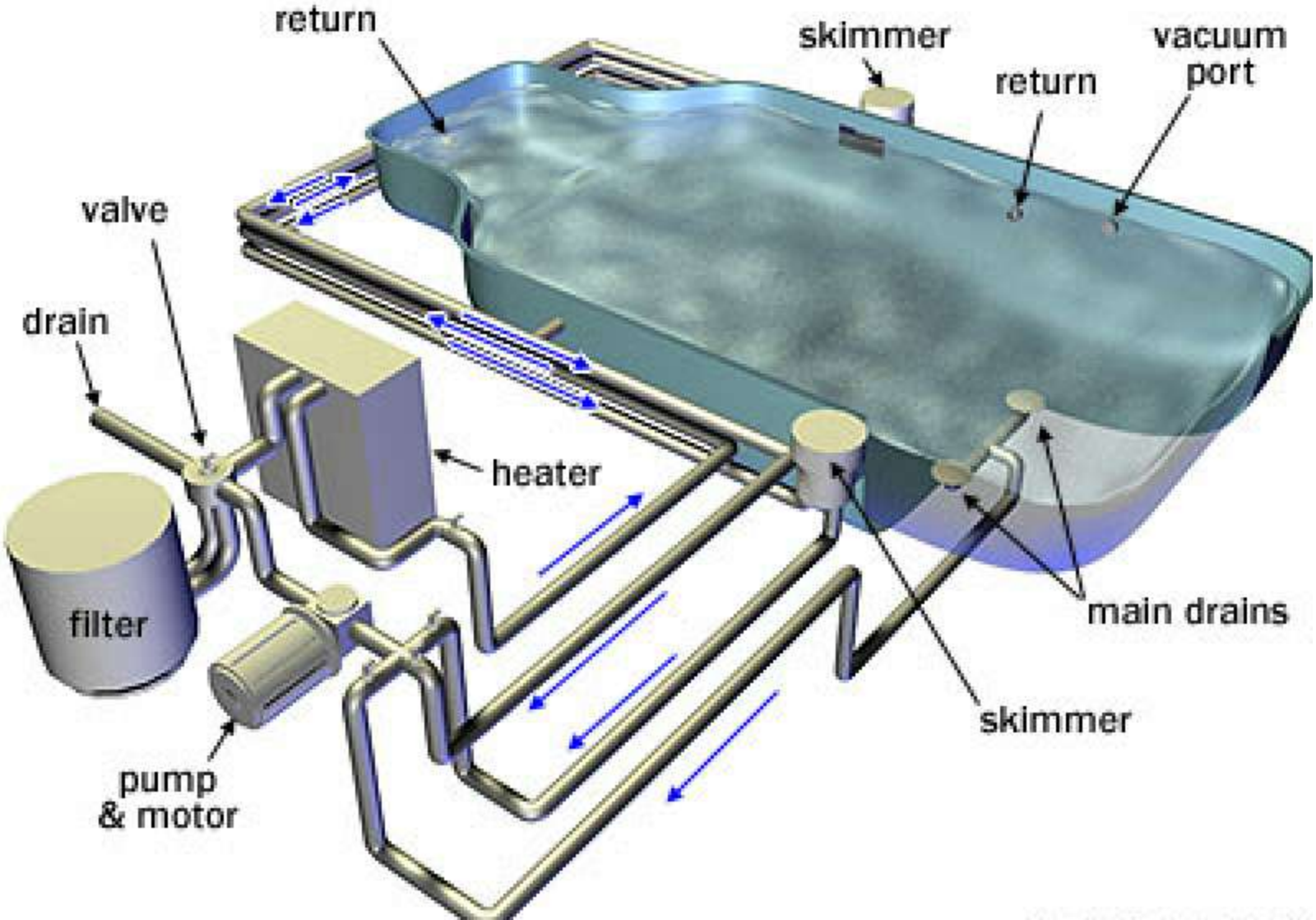


Fig : Skimmer type : Recommended for pools having surface area up to 100 - 150 m2. does not require balance tank, connected directly to filtration pump.

Complete System



Turnover Rates

The Turnover rate varies depending on the quantum of bathers using the pool. Hence the Turnover periods normally accepted by associations involved in the swimming pool industry and by the trade associations such as SPATA and the ISPE standards, UK, are the following

Recommended Pool Turnover Periods

Public or competition pools	**= 2 - 3 hours**
Semi –Public pools	**= 3 - 4 hours**
Diving pools	**= 4 – 6 hours**
Private residential pools*	**= 6 – 8 hours***
Children's or paddling pools	**= 1 - 2 hours**
Lazy river, landing pools, etc.	**= 5 – 6 hours**

It has been proved that at least 7 complete turnover periods are needed before 99% of the pool water has actually passed through the filters

Bather Load

The Maximum SAFE Bather load.

- **Shallow Water (under 1m deep) . . . . . 1 bather per 2.2 square mtrs - (23.7 sq ft)**
- **Standing Water (1 - 1.5 m deep) . . . . . .1 bather per 2.7 square mtrs - (29 sq ft)**
- **Deep Water (over 1.5 m deep) . . . . . .1 bather per 4 square mtrs - (43 sq ft)**
- **Very Deep Water (over 2 m deep) . . . 1 bather per 4 square mtrs**.

The Maximum DESIGN Bathing Load is the **number of bathers per Turnover Period** that the circulation and filtration equipment can successfully support without losing water quality. This means that the pool water will not begin to get cloudy through excessive dirt and debris, and the Free Chlorine level and pH value will remain within acceptable limits throughout the entire pool

Hydraulic considerations / Pipe Velocities

Pipe Velocities

A) Fresh water return inlet pipe velocity : 1.8- 2m/sec

B) Overflow pipe velocity : 0.8-1.2 m/sec

C) From main drains to pump suction : 1.5 m/sec.

Flow Rates

A) From the Overflow Channel : 100% of the Flow Rate

B) From the Drain : As and when required

Inlet Distribution

All over the pool for uniform distribution of filtered and sanitised water

Equipment

- Filters
- Pumps
- Fittings
- Competition Equipment
- Colorado Timers
- Maintenance Equipment.
- Lights
- Heat Pumps.

Filters

- Bobbin Wound Filters
- Size range from 400 mm – 2000 mm
- Outlet turbidity less than 2 FTU.
- The only 2 meter Dia Filters with 4.5 Pressure rating.
- High bed depth up to 1.4 m.
- Filter with 6 inch connection.
- Warrantee at site.

Why FRP Filters ?

Fiber Glass Filters

- **CORROSION FREE : Not affected by oxidizing chemicals like chlorine, bromine, ozone etc. and acids and alkalis.**

- **MAINTENANCE FREE, no additional maintenance cost for years to come.**
- **CORROSION FREE FILTER INTERNALS manufactured in UPVC and Polypropylene**
- **FIVE TIMES LIGHTER than MS Filters enhancing ease of handling and installation**

Mild Steel Filters

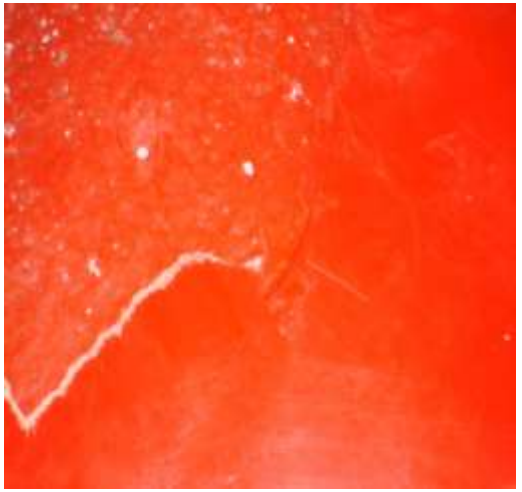
- **PRONE TO CORROSION : by oxidizing chemicals and acids and alkalis.**
- **REGULAR MAINTENANCE required for painting and re-lining, resulting in additional cost.**
- **FILTER INTERNALS manufactured in Mild Steel are prone to corrosion and require periodic replacement.**
- **MS FILTERS being heavier are difficult to handle and install and also increases the load on civil structures**

Aquanomics Filters :Why Best!

Sr. No	Particulars	Astral	Certikin	Aqualux	Aquanomics	Benefit
1	Height (mm)	2020	2150	1800	2420	Extra Filter height gives higher bed depth and greater dirt holding capacity.
2	Bed height (mm)	1000 (max)	1000 (max)	1000 (max)	1200	Improves clarity of water.
3	Working pressure (bar)	2.5	2.5	2.5	4.5	Higher strength. Sturdier Filter.
4	Connection size (mm)	140	140	140	165	165 mm is std size, fittings are easily available plus it reduces velocity at the flange end.
4	Air vent position	Top side	Top side	Top	Top	Ideal position top, this helps in removing all trapped air.
5	No of Diffusers.	3	3	3	4	Helps proper distribution of water results in best filtration quality.

Glimpse - So Called European Products

CRACKED FILTERS



Professional Swimming Pool Pumps

- Most Silent and Energy Efficient Pumps.
- MOC : CI Body with SS wetted parts.
- FROM 0.25 hp – 10 HP
- FLOW RATE RANGE 5 M3/HR – 150 M3/HR
- Strong performance up to 5 mtr negative height.
- CE Certification.

Pool Fittings

- Complete Range of High Quality Durable ABS and SS fittings.
- All Fittings are confirming to all international specifications.
- All inlets and drain are antivotex type.
- Connection as per ASTM and BS Standards only.

Floor Inlets

Drain Grill

Wall Inlets & Suction Conduit port

Skimmer

Pool Side Equipment

- OVERFLOW GRATINGS:

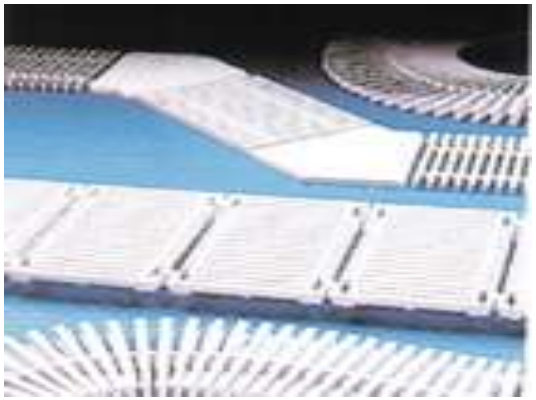
  The entire length of the overflow channel shall be covered by an overflow grating made of PP stabilized against UV.

- LADDERS

  Made of bright polished Stainless Steel (SS 316) Dia 43 mm pipe for firm grip.

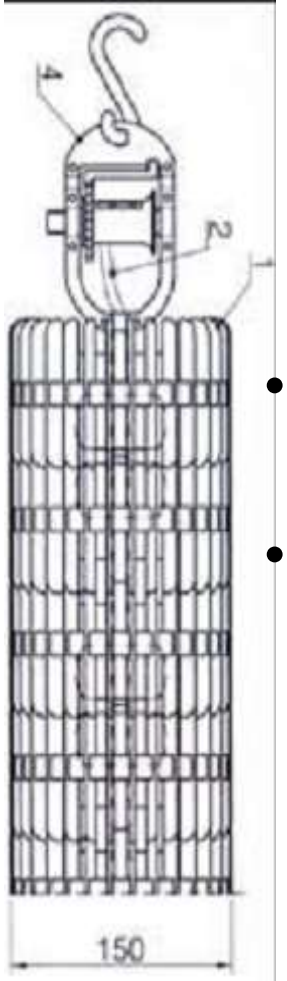
  Design assures safety against any slippery surface, sharp corners & edges.

  Supplied with anchoring fixtures and earthing plugs.



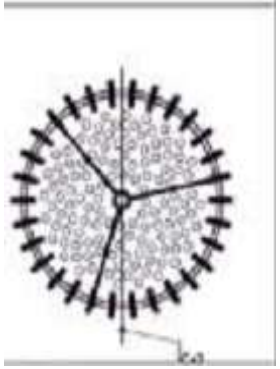
Maintenance Equipments

- Complete range of Maintenance Equipment
- Manufactured in Austria.
- Virgin Material used for the process.
- Innovative Robotic Cleaners



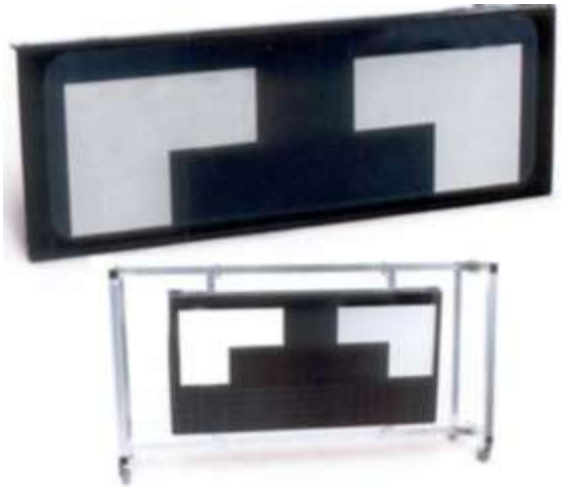
Competition Equipments

- Exclusively Manufactured by Italian Company.
- All Comp Equipments conform to the FINA Standards.



Touch Pad System

- Internationally acclaimed and accepted products.
- Used In almost all Olympic Competition Pools.
- Exclusive Manufacturer of Underwater.
- Touch Pads, Start Systems, Sports Timers, Relay Judging Platforms (RJPs), Score Boards etc are few one of a class products.



ILLUMINATION

- Perfect Focus , optimum LUX and Intensity Light.
- Adjustable Focus 300 Watts Light Manufactured In Brazil.
- Optical Lights with International Quality of Fibers Manufactured Exclusively in Spain.
- DMX control for mood enhancement
- For safety reasons underwater pool lights should not exceed 12V.

Accessories for underwater lights

- JUNCTION BOX

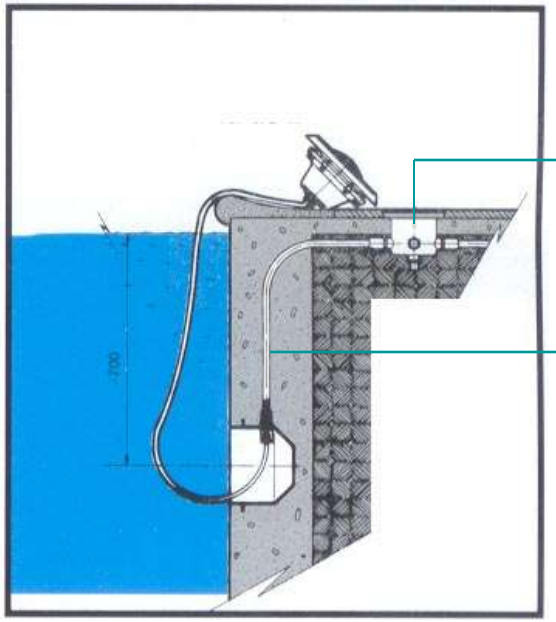
For connection of cable from the light and the transformer.

- TRANSFORMER

• Recommended one transformer per light.

• Recommended to be installed above water level as far as possible.

• Recommended safety standard - IP 65



Sanitization

- Chlorination
  - Dosing Pump.
  - Salt water Chlorinator.
  - Chlorine Dioxide.
- Ozonisation
- Bromination
- U V Sterlization
- Nature – II Express

Insight

- CHLORINATION :

  Is by far the cheapest method of disinfection and can be achieved by using hypochlorite solution, gas chlorination, dichloro or trichloroisocyanuric acid salt water chlorination.

- OZONISATION :

  Is the most effective and the best method of disinfection. Ozone is 3000 times faster than chlorine and kills majority of bacteria and viruses. Ozone adds oxygen to water making it look, feel and taste better. Ozone also adds better clarity and sparkle to the water.

- BROMINATION :

  Bromine is added in the form of tablets. It does not have strong odour or cause eye irritation like chlorine but is very expensive as compared to chlorine

- U V STERLISATION :

  Advantages of this method are that no chemicals are added in the pool water; over dosage is impossible and application is perfectly safe and almost 90% kill is obtained.

Residual Chlorine

One needs to maintain following residual chlorine at all times during bathing load

- Private Residential Pools 1.0 – 1.5 mg/l (ppm)
- Public, Semi-Public, Hotel & Club pools 1.5 – 2.0 mg/l (ppm)

If ozone is used as a disinfectant then one needs to maintain only 0.2 – 0.5 mg/l of residual chlorine.

pH Control

pH CONTROL : The pH of the pool water must be maintained within the range 7.2 – 7.8.

BELOW 7.0 (TOO ACIDIC)	ABOVE 7.8 (TOO ALKALINE)
Excessive eye burn or skin irritation	Sanitizing function of chlorine is greatly weakened.
Etching of the plaster	Water becomes cloudy
Corrosion of metal fixtures.	Scale formation on the plaster.
Add Sodium Bi-carbonate (Soda ash) to raise the pH.	Add Sodium Bisulphate (Dry acid)/ Dilute Hydrochloric acid to lower pH.

Manufacturing

- Efficient Chlorine Dosing Pumps – Indian Make.
- Saltwater Chlorinator – (Reverse Polarity) – Australia.
- Swimming Pool Ozonator & Medium Pressure UV system Manufactured In UK .
- Aquanomics Chorine Dioxide Generator In House Production Unit.

HEAT PUMP

- Efficient Heat Pumps from 5kW upto 155 kW.
- All heat pumps with Scroll Compressor and Titanium Heat exchanger.
- Best COP from 4.5 to 6.5
- Experience of Heating 6600 m3 of pool volume.
- Solar Heating Solutions.

PROJECT PLANNING

STEP 1

DESIGN ENGINEERING

Engineering stage

DRAWING LIST

1] P & ID drawing for the scheme suggested
2] Equipment fixing detail drawing
3] Piping Layout with sizing and invert levels
4] Plant Room layout
5] Balancing tank GA drawing.
6] Foundation drawings.

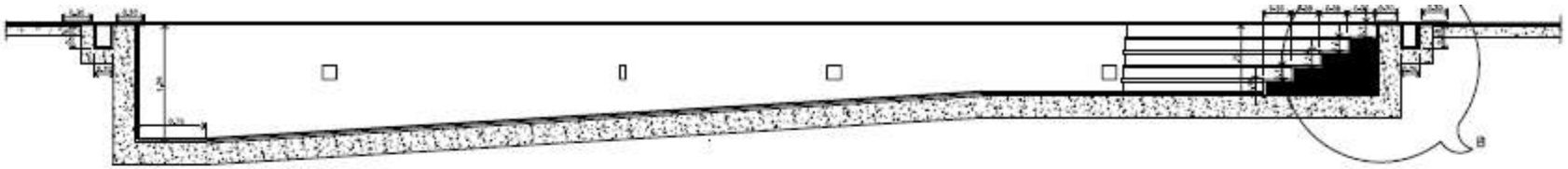
Data sheet approval with consultant/contractor/end client.

Planning and Project scheduling on professional packages like Primavera/MS project.

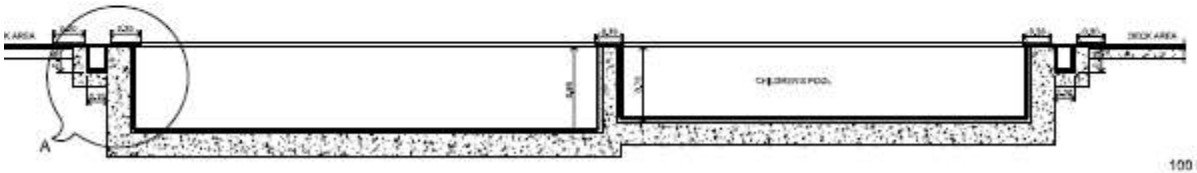
Appointment of FINA affiliated consultant for infrastructure expertise related to the swimming complex.

WE USE SPATA AND ISPE , UK DESIGN

Swimming Pool Section



SECTION AA'
SC - 1:25



SECTION BB'
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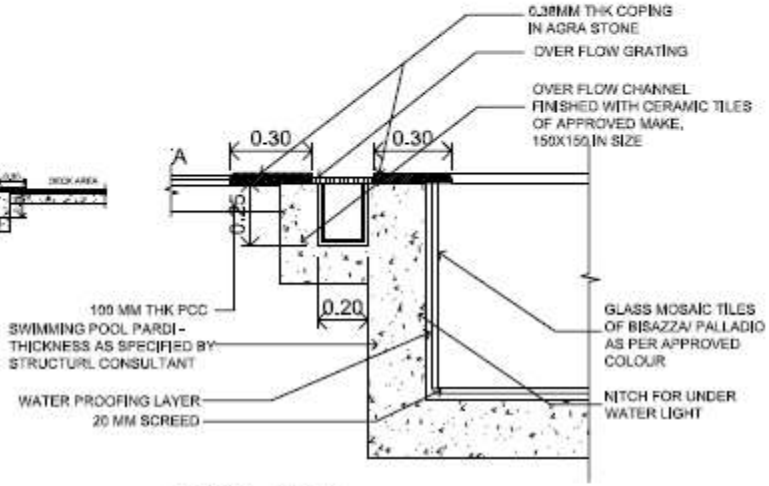
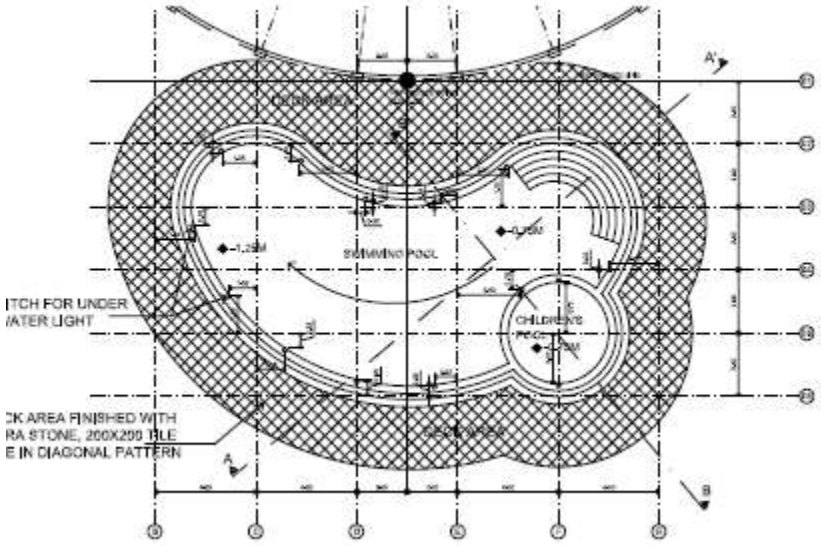
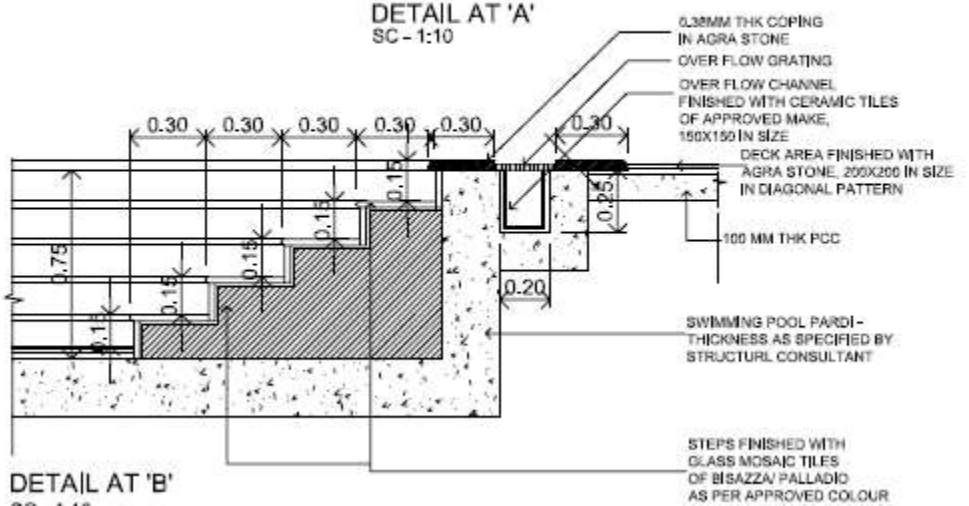


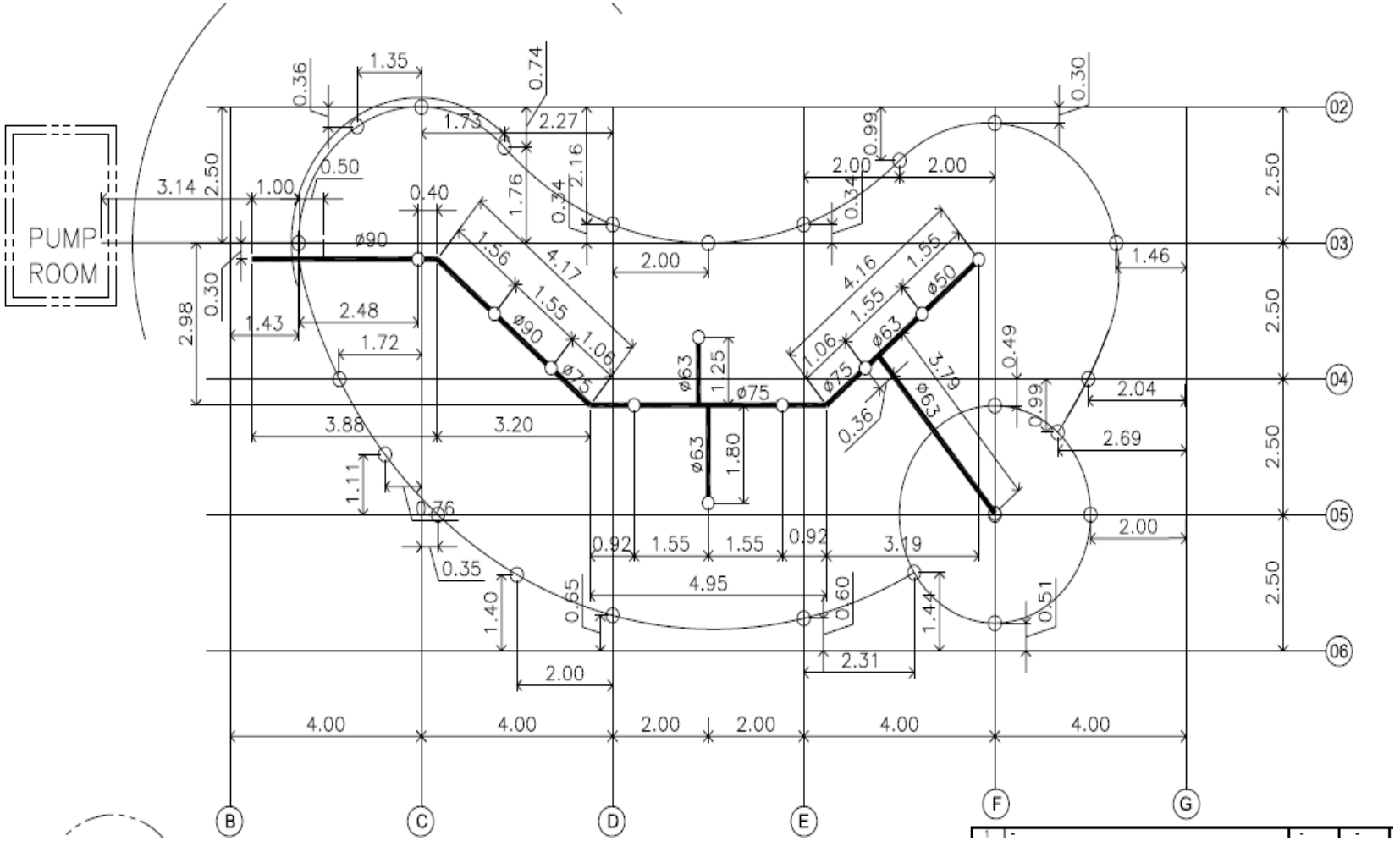
DETAIL AT 'A'
SC - 1:10





DETAIL AT 'B'

Piping Layout



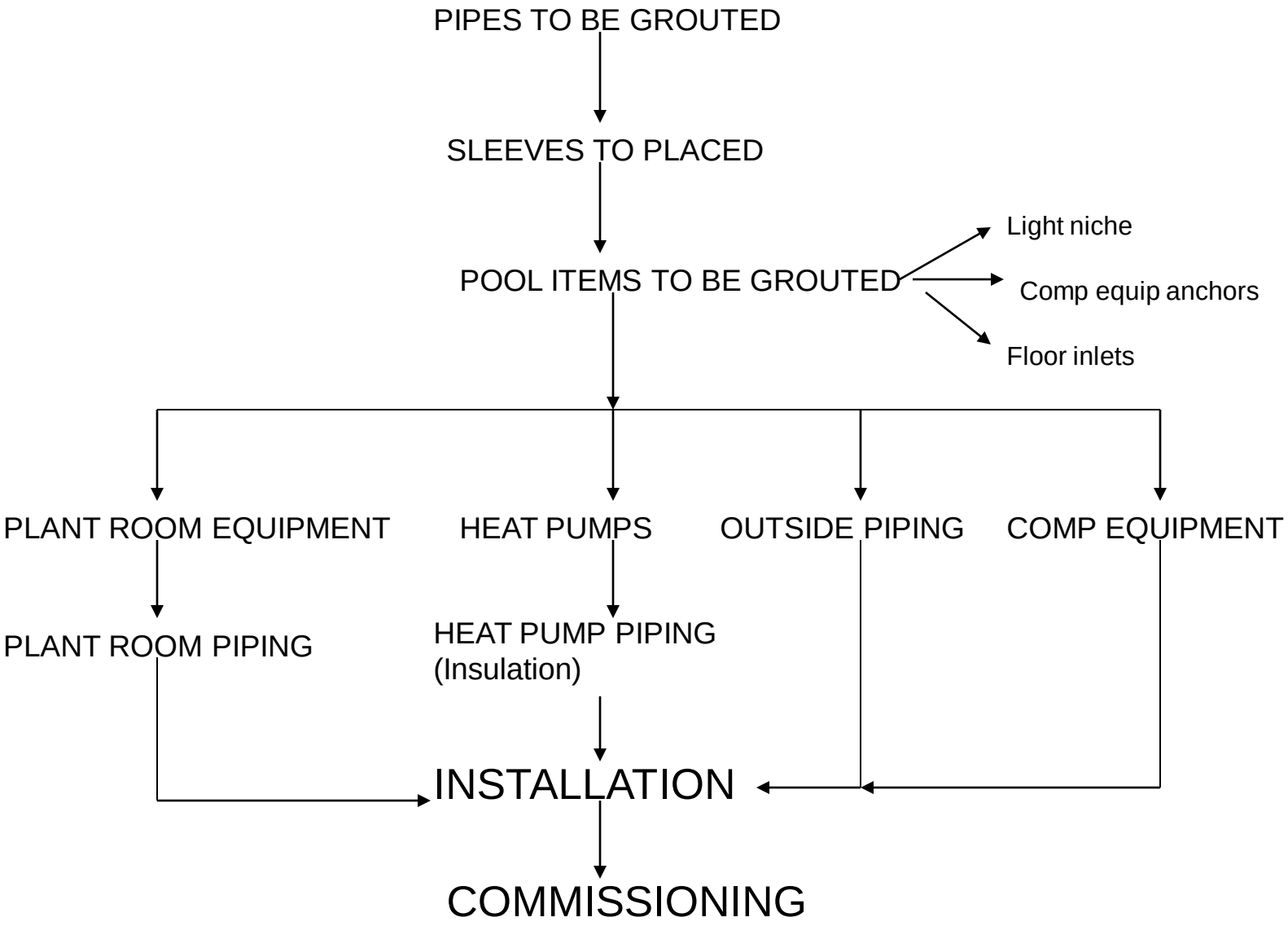
SITE EXECUTION

Pipe Layout

STEP 2

SITE MOBILIZATION

SUPPLY PLANNING



QUALITY PROCEDURES

BRIEF QUALITY PROCEDURES

- All pipes shall be 10.0 kg/cm2.
- All pipes joints and fittings 300 mm and above will be FRP coated.
- Working pressure for filter will be 4.5 Bar.
- Filtration Pump will be AISI 316 Impeller , and Shaft.
- All pipes will be hydro tested.
- Filtration and plumbing will be as per SPATA (Swimming Pool and Allied Trade Association, UK) and ISPE (Institute of Swimming Pool engineers, UK)
- Refrigerant for Heat Pump will be Eco friendly 410A or 407 C.
- All components part of MCC and other items like cable sizing etc will be as per IS

ELECTRICAL CODE OF PRACTICE

1. IS:2516-1972 - Specification for A.C.Circuit breakers
2. IS:4047-1967 - Specification for Heavy Duty Air Break Switches and fuses for voltages not exceeding 1000V.
3. IS:1818-1972 - Specification for A.C. Isolators and earthing switches.
4. IS:2607-1967 - Air break isolators for voltages not exceeding 1000V.
5. IS:2208-1962 - HRC cartridge fuse links upto 650V.
6. IS:3072-1965 - Code of practice for installation and maintenance of switchgear.
7. IS:3106-1966 - Code of practice for select-ion, installation and maintenance of fuses (voltages not Exceeding 650V)
8. IS:4237-1967 - General requirements for switchgear and control gear for voltages not exceeding 1000V.
9. IS: 375-1963 - Marking and arrangement for switchgear bus bars, main connection & auxiliary wiring.
10. IS:2705-1964 - Current Transformers
11. IS:1248-1968 - Direct acting electrical indicating instruments.
12. IS:2419-1963 - Dimensions of electrical indicating instruments.
13. IS:3231-1965 - Electrical relays for power system protection.
14. IS:2147-1962 - Degree of protection provided by enclosures for low voltage switch gear and control gear.
15. Explosives Act
16. IS:8623 Factory built assembles of Switchgear and Control gear
17. IS:4237 General requirements of Switchgear and Control gear for voltages not exceeding 1000 Volts.
18. IS:2208 and IS:9224 HRC Fuse Links
19. IS:6875 Control Switches and Push Buttons
20. IS:2959 Auxiliary Contactors.

MAINTENANCE OF POOL

SOME TIPS ON MAINTENANCE OF POOL

A] Guideline for Fill Water

Appearance	: Clear and free from suspended matter
pH	: 7.2 – 8.0
Total Hardness	: 50 – 400 mg/l
Total Dissolved Solids	: less than 500 mg/l

In addition to the above one should check for presence of iron and manganese.

B] CHEMICAL STANDARDS

B.1 DISINFECTANT

Disinfectant level : 1.5 – 2.0 mg/l (free Chlorine)

Disinfection by definition is destruction of micro - organisms, reducing them to a level not normally harmful to health.

Various Forms of Chlorine is used as disinfectant. When Chlorine is added in water, some is consumed reacting with any pollutant present, some reacts with nitrogenous impurities to form chloramines (combined chlorine) and some remains freely available for disinfection and algae control. This is measured as **Free Chlorine**.

Types of Chlorine: Commonly used sources of chlorine in Pool water are:

Chlorine Gas

Sodium Hypochlorite

Calcium Hypochlorite

Electrolytic Hypochlorite generators and last but not the least

TCCA (granules or tablets)

WHY TCCA

- Available with 90% chlorine concentration
- Due to high chlorine content, handling is easy for large pools.
- Reduces chlorine loss during day time
- Does not form chloroamines hence does not cause skin and eye irritation.
- Makes water looks sparkling and fresh
- Reduces algae growth as compared to any other disinfectant.

B.2

pH : 7.2 – 7.8

If pH is too low following phenomena occurs

- water becomes acidic
- Chlorine residue dissipates rapidly
- eye irritation occurs
- plaster walls are etched
- metal fittings, pump impeller, heater may corrode
- dissolved metals may leave stains on walls
- rapid loss of alkalinity

If pH is high following phenomena occurs

- chlorine activity is slowed down and inefficient
- Scale formation and discolouration of pool walls
- Water becomes cloudy
- Filter is overworked

B.3

Alkalinity : 8 0 – 120 mg/l

Alkalinity is described as the amount of alkaline compounds (carbonates, bicarbonates and hydroxides) present in pool water.

Pool kits available in the market do not have any means of measuring this parameter and its importance is often under estimated. If the alkalinity is less (< 60 mg/l) there can be rapid change in pH. Corrosion in exposed metals, eye irritation and even coloured water (usually green). High alkalinity (> 160 mg/l) is not as serious but can resist change in pH, making pH adjustment difficult and may cause cloudy water.

B.4

Sulphates : < 400 mg/l

High sulphate level can cause attack on tile grouting and concrete. Sulphate may be present in fill water or may be added to the pool by use of sodium bisulphite (dry acid) for pH correction and aluminium sulphate to aid filtration.

ROUTINE TO MAINTAIN CLEAN AND HYGENIC POOL.

- Feed the pool with disinfectant to satisfy its requirement either manually or automatically.
- Remove floating leaves
- Check the water level is high enough for the pump to operate correctly
- Vaccum the pool daily
- Clean the tiles with nylon and SS brushes regularly
- Backwash filter regularly
- Test pH and free chlorine levels daily.

Trouble Shooting

PROBLEM	SYMPTOM	CAUSE	REMEDY
Green Water	Green color	Algae	1. Shock treatment with Sodium Hypo or DCCA.
Colored Water	Green, brown or black	Metal ion	1. Use coagulant or sand filter with alum
pH decrease	pH below 7.0	Low alkalinity or low calcium hardness	1. Adjust pH to 7 – 7.5 by adding soda ash. 2. Maintain alkalinity in the range of 50 – 100 ppm.
Eye irritation/Strong chlorine odour	Irritation, Itching Skin	Improper pH Presence of chloroamines.	1. Adjust pH to 7 – 7.5 2. Super chlorinate with TCCA.
Cloudy Water	Hazy, cloudy water	Presence of: Algae and bacteria	

PROBLEM	SYMTOP	CAUSE	REMEDY
Cloudy water contd……		Not enough filtration High pH and alkalinity	1. Shock Treatment with TCCA. 2. Check filtration operation. 3. Adjust pH and alkalinity
Scale formation	Mineral deposits on pool's surface, plumbing fixtures and filters (MS)	High pH, Excess alkalinity and excess Ca hardness	1. Reduce pH to 7.0 – 7.5 2. Use muriatic acid or sodium bisulphate
Excess available chlorine	Chlorine odour and irritation	Excess chlorine	Use sodium thiosulpahte

AQUANOMICS Highlights

- Aquanomics bagged the prestigious National Games Project.
- Triogen UK, the Global Leader in Ozone & UV systems signs exclusive distribution agreement with Aquanomics.
- Aquanomics register a record sale of Zodiac Prefab pools.
- Aquanomics supplied equipment to more than 4500 pools in India.
- Aquanomics bags the prestigious D. Y. Patil Sports Academy Olympic size swimming pool and completes in record time of 35 days.
- One of the best in house Technical expertise with ISPE, UK membership to support pool and spa engineering.
- International operation started in Malaysia and Dubai to follow.
- On the panel of Water Asia, Water Digest and now EAW.
- Aquanomics appointed consultant & supplier for the pool and spa project @ the world most expensive house.

NO OTHER SWIMMING POOL COMPANY IN INDIA HAS ISPE MEMBERS AQUANOMICS SYSTEMS HAS IT ON BOARD